

A-1



Golder Associates Inc.
CONSULTING ENGINEERS

Industri-plex
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INTERIM REPORT NO. 1

BASELINE AIR SURVEY
PRE-DESIGN INVESTIGATION TASK A-1
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

Prepared for:

Industri-Plex Site Remedial Trust
800 North Linbergh Boulevard
St. Louis, Missouri



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July 1990

Project No.: 893-6255



Golder Associates Inc.

CONSULTING ENGINEERS

July 26, 1990

Project No. 893-6255

United States Environmental Protection Agency
Region I
J.F.K. Federal Building, HRS-CAN-3
Boston, MA 02203-2211

Attn: Marilyn M. Wade, P.E.
Remedial Project Manager

RE: INDUSTRI-PLEX SITE, BASELINE AIR SURVEY,
INTERIM REPORT NO. 1

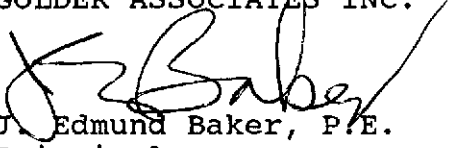
Dear Ms. Wade:

On behalf of the Industri-Plex Site Remedial Trust, we are submitting the attached Interim Report No. 1 for Pre-Design Investigation Task A-1, Baseline Air Survey. These data, along with data from future sampling rounds, are intended to document the baseline air quality at the site prior to initiation of Remedial Action.

If you have any questions, please contact us.

Very truly yours,

GOLDER ASSOCIATES INC.


J. Edmund Baker, P.E.
Principal

RMG/JEB/pd
C:A-1CL

Attachments

cc: K.P. Winkler, ISRT (w/o attachments)
W.L. Smull, ISRT (w/o attachments)

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1.0 INTRODUCTION

1.1 Objectives

One of the requirements of the Consent Decree for the Industri-Plex Site Pre-Design Investigation, as stated in the Remedial Design/Action Plan (RDAP), is to conduct

"a baseline investigation to establish an effective air monitoring program and to determine acceptable on-site and off-site air quality standards for hazardous volatile compounds and/or other odorous compounds and dust relative to planned grading, consolidation, excavation, dredging, groundwater treatment and capping activities."

A baseline air survey is being conducted under Pre-Design Investigation Task A-1 to document the baseline conditions relative to potential types of emissions expected during remedial action. Specifically, the air survey addresses Air Data Need No. 3 given on page 107 of the Pre-Design Work Plan. Target Compound List volatile organic compounds (TCL VOCs) constitute the hazardous volatile compounds, and reduced sulfur compounds (including hydrogen sulfide and methyl mercaptan) constitute the major odorous compounds. The concentration of dust (as well as the concentrations of arsenic, lead, and chromium in dust) will also be determined.

Four rounds of air sampling are planned. This interim report presents the methods and results for the first round of air sampling conducted in May 1990. Additional Interim Reports will be prepared for the next two rounds. Proposed air quality standards will be developed and presented with the results of all four sampling rounds in the Interim Final Report for Pre-Design Task A-1.

1.2 History and Source Areas

Pertinent site history regarding air quality and the results of previous investigations are given in Section 3.5.3.1 and Appendix A of the Pre-Design Work Plan. The Record of Decision (ROD) states that repeated complaints have been received from local citizens in the past, especially southeast of the site, with respect to offensive odors generated by the hide piles. These complaints have been associated with former site development activities and rain storms. Increased odors during storms are believed to be largely due to exposure of fresh areas of the hide piles to the atmosphere after slumping of the unstable slopes, and due to increased emissions as a result of pressure gradients induced by lower barometric pressure during storms events.

The hide piles are a source of odors at the site. The composition of the hide pile gas was determined during the Remedial Investigation, and the odorous areas and compounds at the site were identified by soil gas sampling/laboratory analysis and use of an odor panel. The East Hide Pile was determined to be the dominant odor source. The odorous compounds were determined to be mainly hydrogen sulfide, which occurred at concentrations of 5,600 to 21,000 ppm within the East Hide Pile. Hydrogen sulfide was not detectable above ground using portable monitoring equipment. Methyl mercaptan was detected in East Hide Pile gas at concentrations ranging up to 150 ppm. Other mercaptan compounds were also detected at individual concentrations of up to 180 ppm. Benzene and toluene were detected in East Hide Pile gas at 1 to 11 ppm. Additional compositional data for the East Hide Pile gas are being collected under Pre-Design Investigation Task A-2. The East Hide Pile remediation will include a gas collection layer and a gas treatment plant.

Benzene and toluene could also potentially be emitted from the groundwater treatment plant which will be installed in order to remediate Hazardous Substances in groundwater. Dust, and metals in dust, might be introduced into the air during site grading and capping activities that will remediate Hazardous Substances in soil.

2.0 FIELD METHODS

Sampling locations were selected based upon the results of air dispersion modeling using regional meteorological data conducted during the Remedial Investigation/Feasibility Study (RI/FS) and the historical locations of odor complaints. Sample locations were given in Figure 47 of the Pre-Design Work Plan. Some of the sampling points were slightly relocated based upon a field inspection by Mr. Bob Glazier (Golder Associates Task Leader) and Mr. Arnie Ostrofsky (NUS Project Manager). The revised locations are given in Figure 1 of this report along with the location numbers used in the laboratory report. The field duplicate was designated location number 13 and the trip blank number 14.

Air samples were collected in accordance with the procedures given in Section 5.1 and Attachment 1 of the Pre-Design Investigation Field Sampling Plan (FSP) during a 24-hour period beginning the afternoon of May 15, 1990. The sampler inlets were positioned at least three feet above average grade by either placing them on top of large isolated boulders (locations 2, 6, 7, 8, and 12) or suspending them from low tree branches (locations 1, 3, 4, 5, and 11) such that other nearby branches did not obstruct the sampler inlet ports. The sampler at location 10 was suspended from the top of unused playground equipment in the middle of an open field. At location 9, the samplers were positioned on top of a overhang above the school doorway on the side of the school facing the Industri-Plex Site. The school principal indicated that classroom windows must be shut at times due to odors from the site.

All sampler inlets were facing into the wind at the start of sampling. A duplicate sample was collected for all analyses at location 5, and a trip blank canister and filter cassette accompanied the samplers on the round trip from lab to site and back to the lab.

TCL VOCs, methane, and reduced sulfur compounds were collected in 15-liter Summa passivated canisters. The vacuum flow regulators were calibrated to 7 milliliters per minute by the laboratory and the flow rate/vacuum pressure recorded by the laboratory on the canister chain-of-custody record prior to shipping. The vacuum pressure was checked and recorded in the field prior to and after sampling. Upon receipt by the laboratory, the vacuum pressure and vacuum flow regulator calibration were checked and recorded. These checks are documented on the canister chain of custody forms (given in the lab report in Appendix A) and in Table 1. Sampling was initiated by removing the inlet valve dust cover and opening the valve. The valve was closed and the inlet dust cover replaced approximately 24 hours later. Chain of custody documentation was completed and the samples were sealed in shipping containers and sent by overnight courier to Enseco's Air Toxics laboratory in El Monte, California.

Dust was collected on filter cassette cartridges using an SKC Model 224-PCXR7 programmable personal sampling pump. The pump was set to a flow rate of 2 liters per minute just prior to sampling using a rotameter which had been calibrated to a primary standard (1000-ml film type flowmeter). Correction of the flow rate to standard dry air conditions (760 mm Hg, 298 K [25 degrees Celcius], 0 percent relative humidity) results in a flow rate of 2035 ml/min using the time-weighted-average conditions given in Section 6 below. The pump was programmed to alternately pump for one minute then shut down for two minutes such

that a 977 liter sample was collected over a period of 24-hours. Two separate pumps were used to collect field duplicate dust samples at location 5. Twenty four hours after the start of sampling, the pumps shut down, the inlet caps were replaced on the cassettes, and they were shipped under chain of custody to Enseco-East by overnight courier. The flow rate of each pump was checked after sampling. The flow checks for the dust sampling pumps are documented in Table 1 and Appendix B. The final flow rate of all dust sampling pumps was within 10 percent of the original flow rate (see Table 1 and Appendix B).

All samplers appeared to be intact and did not show evidence of tampering except for the dust cassette at location 12, which was found on the ground at the end of the sampling period. The vacuum pressure of all Summa canisters were checked upon receipt at the laboratory and were within 2 inches Hg of the value recorded in the field, except for the canister at location 12 (see Table 1 and lab report in Appendix A). The flow rate of each vacuum flow regulator was within 11 percent of the original flow rate, except for the canister at location 12. The dust cassette at location 12 also showed evidence of tampering. Therefore, no useable data were collected at location 12. This location is the farthest downwind sample (about 2 miles, see Figure 1) and is not a critical sample.

3.0 LAB METHODS

The samples were received by Enseco on May 17, 1990. Samples were analyzed in accordance with the procedures and analytical methods given in the FSP and the QAPjP except for the dust samples (see discussion in Section 5 below).

It was not possible to spike the Summa canisters with both sulfur containing compounds and TCL VOCs because they would react with each other. Therefore, because the odorous sulfur compounds are of greatest concern at the site, the canisters were only spiked with the sulfur compounds.

Laboratory Control Samples and Duplicate Control Samples were analyzed with each batch of samples from the site.

4.0 LAB RESULTS

The results of the analyses are presented in Appendix A and summarized in Tables 2 and 3. Methane and reduced sulfur compounds were not detected in any of the samples. The following TCL VOCs were detected (maximum concentrations detected in parentheses): trichlorofluoromethane (8.8 ppbv); 1,1,2-trichloro-1,2,2-trifluoroethane (5.6 ppbv); 1,1,1-trichloroethane (5.9 ppbv); acetone (11 ppbv); 2-butanone (21 ppbv); benzene (4.3 ppbv); toluene (18 ppbv); xylene isomers (12 ppbv); and 1,2,4-trimethylbenzene (4.6 ppbv). None of the above compounds were detected in the trip blank. The Summa canister at location 12 showed evidence of leakage during shipment back to the laboratory (see vacuum pressure readings in Table 1). Total dust measurements include negative masses and are suspected to be in error (see discussion in Section 5 below). Arsenic, lead, and chromium were not detected in any of the dust samples.

5.0 ASSESSMENT OF DATA USABILITY

There are no hold times for these analyses, but it was planned to analyze as many of the sensitive compounds as possible within 72 hours of receipt by the lab. Sensitive analyses include TCL VOCs and reduced sulfur compounds. For both the TCL VOC and sulfur compound analyses, eight of the fourteen analyses were conducted within 72 hours of receipt. The sulfur compound stability study documented in the lab report indicates that sulfur compounds in the remaining six samples should not have been affected by storage. There are no project-specific data to support such a conclusion for the TCL VOCs, but hydrogen sulfide is a very mobile and reactive compound and because it was not affected by storage (leakage or reaction with container materials), the same is probably true for the TCL VOCs.

The Laboratory Control Samples (LCS) and Duplicate Control Samples (DCS) for the TCL VOCs and metals in dust by ICP were within the control limits indicating that laboratory precision and accuracy were acceptable. Reproducibility of the field duplicates is not applicable as most compounds were not detected, and for the two compounds that were detected (Freon-11 and 2-butanone), the results for at least one of the duplicate analyses was less than two times the method detection limit. The LCS/DCS results for methane were not reported because the lab is currently building a historical data base with which to set control limits. The results for the LCS/DCS samples have been requested from the laboratory and will be included in the next Interim Report.

As discussed above, spike recoveries and spike duplicate precision were within control limits for the reduced sulfur compounds and were not assessed for TCL VOCs and

methane due to potential reaction with the sulfur compounds. Spike recoveries for metals in dust were very low and outside the control limits given in the QAPjP. In addition, the total dust measurements are unusable (see below). Therefore, although no metals were detected in dust, these results are considered unusable.

The laboratory did not use the same balance for the initial and final mass measurements of the dust filters. The total dust measurement data are presented in Table 3. The negative masses are believed to be the result of using two different balances for the initial and final mass determinations. It was assumed that because the range of mass measurements was very small (all within a few milligrams), a correction factor could be applied to the final mass measurements. Using this approach, 0.9 mg would be added to all mass differences because the most negative mass difference is -0.9 mg. The resulting corrected mass difference is a minimum dust concentration. However, the trip blank had the second highest mass difference, suggesting contamination in the measurement system or poor accuracy. Therefore, all dust measurement data (and consequently arsenic, lead, and chromium in dust) for this round are considered unusable. The two background samples are considered critical and will be replaced during July 1990. The laboratory was notified of the balance error and has instituted corrective action measures to prevent recurrence of this problem.

Data were reported for all samples. However, the dust samples are considered unusable. The two background dust samples are critical and must be replaced. Other than dust, the overall data set is considered to be complete. Data are reported in standard units and were determined using accepted procedures. Therefore, the data (other

than the dust samples) are considered to be precise, accurate, comparable, complete, and representative of the conditions at the time of sampling.

6.0 METEOROLOGICAL DATA

Meteorological data, including wind speed and direction, relative humidity, temperature, and barometric pressure were recorded by the site weather station during sampling. The data are presented in Appendix C. The performance of the meteorological system was audited by C.T. Main Inc. prior to sampling. The audit report is given in Appendix D. The results of the audit indicate that all instruments were providing acceptable data except for the relative humidity probe. Therefore, C.T. Main deployed another relative humidity recording system on the site weather tower from approximately 15 hours prior to sampling until about 18 hours after sampling. The replacement relative humidity system responded to relative humidity conditions in a manner consistent with USEPA guidelines.

The site was under a high pressure system during the beginning of sampling (29.9-30 inches Hg), including winds from the southwest at about 10-12 mph, low relative humidity (about 35-40 percent), clear skies, and no rain. Near the end of the sampling period, conditions changed including cloudy skies, winds from the northeast at 2-5 mph, much higher relative humidity (near 100 percent), and occasional light rain. However, the barometric pressure did not change significantly during the sampling period. Time weighted average conditions, which were used to correct the dust pump flow rate, are as follows: temperature=290 K (17 degrees Celcius), barometric pressure=762 mm Hg, relative humidity=64.6 percent [vapor pressure of water=9.56 mm Hg].

7.0 DATA REDUCTION

The concentration data for methane, reduced sulfur compounds, and TCL VOCs are reported by the laboratory in parts per million and parts per billion by volume (ppmv, ppbv) and therefore do not need to be corrected to standard pressure and temperature. Relative humidity corrections result in changes of less than 1 percent in the results and have not been applied to the data because the accepted precision of the method can cause results to differ by up to 20 percent. Data for dust and metals in dust have already been corrected to standard conditions by correcting the flow rate of the sampling pumps to standard conditions as discussed in Section 2 above.

8.0 SUMMARY

The first round of air samples under Pre-Design Task A-1 were collected in accordance with the Pre-Design Work Plan and Field Sampling Plan. All samples were analyzed in accordance with the procedures given in the Field Sampling Plan. No reduced sulfur compounds or methane were detected at any of the sample locations. The only Target Compound List VOCs detected include trichlorofluoromethane (Freon 11); 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113); acetone; 2-butanone (MEK); 1,1,1-trichloroethane; benzene; toluene; xylene isomers; and 1,2,4-trimethylbenzene. None of these compounds were detected in the trip blank. All dust measurements were considered to be unusable and will be resampled during July 1990. Valid data were collected for all other analytes at all locations except location 12 because the Summa canister showed evidence of leakage during shipping back to the laboratory. Location 12 is not considered to be critical, and the data do not need to be replaced.

C:6255:REPORTS:AIRFTEXT

TABLE 1

SAMPLER CALIBRATION CHECKS

Sampler Type	Location	Flow Rate (ml/min)		Vacuum Pressure(a)	
		Initial	Final	Lab	Field
Summa	1	7.3	7.5	30/16	30/16
Canister	2	7.0	6.8	30/15	31/16
	3	6.9	7.0	30/15	29/16
	4	7.4	6.6	30/14	31/15
	5	7.2	6.8	30/11	30/12
	6	7.4	7.3	30/15	30/15
	7	7.1	6.9	30/16	30/16
	8	6.9	6.8	30/15	30/16
	9	7.0	6.8	30/18	31/18
	10	7.0	7.0	30/16	31/18
	11	7.1	7.1	30/16	30/16
	12	7.4	8.6	30/12	30/18
	13(b)	7.3	6.8	30/15	30/17
	14(c)	NA	NA	30/29	30/30
Dust Pump(d)	1	56	55	NA	NA
	2	56	53	NA	NA
	3	56	51	NA	NA
	4	56	55	NA	NA
	5	56	57	NA	NA
	6	56	52	NA	NA
	7	56	54	NA	NA
	8	56	54	NA	NA
	9	56	53	NA	NA
	10	56	54	NA	NA
	11	56	51	NA	NA
	12	56	54	NA	NA
	13(b)	56	56	NA	NA
	14(c)	NA	NA	NA	NA

Notes:

- (a) Readings given in inches of Hg. Data include initial/final readings for each canister custodian (field and lab).
- (b) Field duplicate of location 5.
- (c) Trip blank.
- (d) Flow rate values for dust pumps are original rotameter readings and have not been converted to ml/min.

TABLE 2

SUMMARY OF ANALYTES DETECTED DURING MAY 15-16, 1990

Analyte	Location	Concentration(ppbv)	Detection Limit (ppbv)
Trichlorofluoromethane (Freon 11)	3	8.8	1
	4	1.5	1
	5	3.4	1
	6	1.5	1
	8	1.3	1
	10	1.7	1
	11	1.8	1
	12	1.5	1
1,1,2-trichloro-1,2,2- trifluoromethane (Freon 113)	3	5.6	2
	3	5.9	2
1,1,1-trichloroethane	10	2.0	2
	10	11	10
Acetone 2-butanone (MEK)	1	7.8	3
	3	13	3
	4	10	3
	6	3.6	3
	7	4.2	3
	9	4.0	3
	10	21	3
	11	18	3
	12	3.4	3
	13	4.3	3
	3	4.3	3
	3	18	3
Benzene Toluene	10	9.6	3
	3	12	5
Total xylenes	10	6.9	5
	3	4.6	3
1,2,4-trimethylbenzene	3		

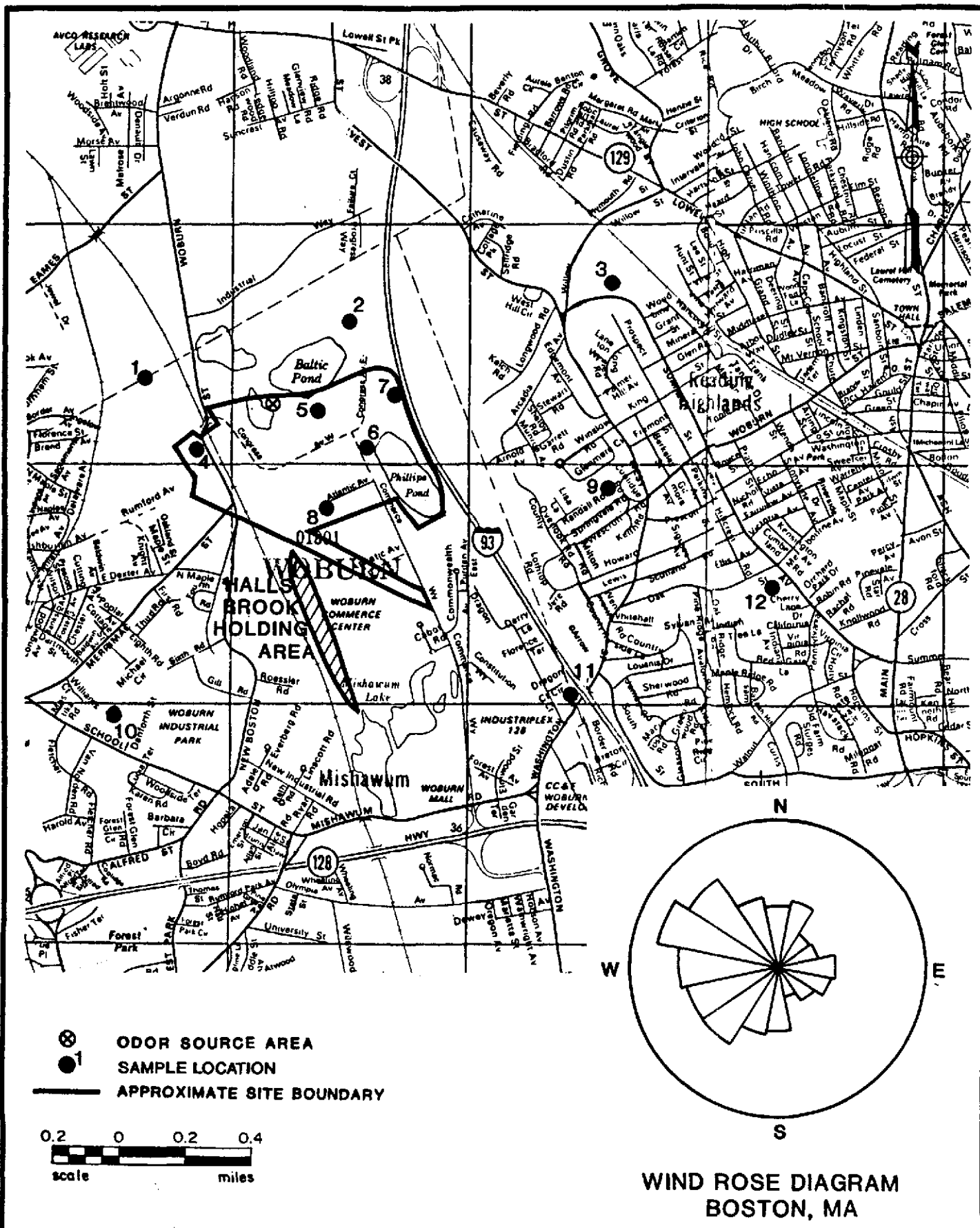
Note: See laboratory report in Appendix A for listing of compounds which were not detected and their respective detection limits.

TABLE 3

TOTAL DUST MEASUREMENTS DURING MAY 15-16, 1990

Location	Initial Mass (mg)	Final Mass (mg)	Mass difference (mg)
1	33.5	34.0	0.5
2	33.7	33.5	-0.2
3	33.9	33.4	-0.5
4	37.3	36.9	-0.4
5	37.2	37.0	-0.2
6	36.2	37.3	1.1
7	36.2	36.0	-0.2
8	36.5	35.9	-0.6
9	36.6	36.6	0.0
10	36.8	36.5	-0.3
11	36.7	36.6	-0.1
12	36.7	36.7	0.0
13	36.7	36.5	-0.1
14	36.5	37.2	0.7
15	36.6	36.6	0.0
16	36.8	35.9	-0.9

Note: Mass difference divided by 977 liters equals dust concentration in milligrams per cubic meter. Location 13 is a field duplicate of location 5. Location 14 is a trip blank, and locations 15 and 16 are matrix spike and matrix spike duplicate samples.



JOB NO.	893-6255	SCALE	AS SHOWN	AIR SAMPLE LOCATIONS
DRAWN	LAS	DATE	07/06/90	
CHECKED	RMG	DWG. NO.	MA01-096	
Golder Associates				INDUSTRI-PLEX SITE REMEDIAL TRUST
				FIGURE 1

APPENDIX A
LABORATORY REPORT

Enseco

Analytical Support Documentation
for Golder Associates
Enseco-Air Toxics Laboratory No. A9013805
Enseco-East Project No. 007793



June 28, 1990

Ms. Elizabeth Auda
Golder Associates
20000 Horizon Way
Suite 500
Mt. Laurel, NJ 08054

Dear Ms. Auda:

Enclosed are the results of the analyses performed for the Industri-Plex Task A-1 air sampling program (Purchase Order No. 893-6260). Results for methane and sulfur compounds were provided by Enseco-Air Toxics Laboratory and are found in Section One of this report. Metals analyses were subcontracted by Enseco-East (Enseco East Project No. 007793) to AnalytiKEM Inc. and the results for these analyses are found in Section Two. This letter authorizes the release of the analytical results and should be considered an integral part of this report.

Please refer to this project by the Enseco-East Laboratory Identification Number to help expedite any future discussions. We will be happy to answer any questions or concerns that you may have.

Sincerely,

ENSECO-EAST LABORATORY

A handwritten signature in cursive script that reads "Lidya Gulizia".

Lidya Gulizia
Program Administrator

Enc.

Enseco - Air Toxics Laboratory

9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

June 12, 1990

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-001/014
ANALYSES: Sulfur Compounds (CARB 16),
Methane (SCAQMD Method 25.2), Volatile
Organics by GCMS - EPA T014
DATE SAMPLED: 24 hour composite
samples taken from 5/15/ to 5/16/90
DATE SAMPLE REC'D: 5/17/90

PROJECT: INDUSTRIPLEX

Enclosed with this letter is the report on the chemical and physical analyses on the samples from ANALYSIS NO: A9013805-001/014 shown above.

The samples were received by ENSECO Air Toxics Laboratory, intact and with the chain-of-custody record attached.

Please note that ND () means not detected at the detection limit expressed within the parentheses.

Martha M. Louey
REVIEWED

Steve D. Davis
APPROVED

Enseco - Air Toxics Laboratory

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-001/014
ANALYSES: Methane (SCAQMD Method 25.2)
DATE SAMPLED: 24 hour composite samples
taken from 5/15 to 5/16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 6/06/90, 6/07/90*
SAMPLE TYPE: Air

METHANE

<u>SAMPLE IDENTIFICATION</u>	<u>COMPOSITE SAMPLING TIME</u>		<u>RESULTS</u> ppm (vol/vol)
	<u>5/15/90</u>	<u>5/16/90</u>	
* A-075 (Location 10)	15:10	15:18	ND(8)
A-078 (Location 4)	15:27	15:48	ND(8)
A-071 (Location 1)	15:21	15:38	ND(8)
A-079 (Location 11)	15:02	15:12	ND(8)
A-068 (Location 2)	14:09	14:05	ND(8)
A-076 (Location 12)	14:52	14:51	ND(8)
A-073 (Location 9)	14:41	14:40	ND(8)
* A-095 (Location 3)	14:28	14:24	ND(8)
A-069 (Location 7)	16:14	16:32	ND(8)
A-096 (Location 6)	16:27	16:42	ND(8)
A-074 (Location 13)	16:50	16:51	ND(8)
A-072 (Location 8)	15:51	16:00	ND(8)
A-077 (Location 5)	16:52	16:50	ND(8)
A-070 (Trip)	NA	NA	ND(8)

The Report Cover Letter is an integral part of this report.

This report pertains only to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of this Laboratory's name for advertising or publicity purposes without authorization is prohibited.

Enseco - Air Toxics Laboratory

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-001
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:10 to 5/16/90
at 15:18
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/21/90
SAMPLE TYPE: Air

Sample ID: A-075 (Location 10)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

Enseco - Air Toxics Laboratory

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LABORATORY REPORT**GOLDER ASSOCIATES**

20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

Sample ID: A-078 (Location 4)

ANALYSIS NO.: A9013805-002

ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:27 to 5/16/90
at 15:48

DATE SAMPLE REC'D: 5/17/90

DATE ANALYZED: 5/17/90

SAMPLE TYPE: Air

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

The Report Cover Letter is an integral part of this report.

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LABORATORY REPORT

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-003
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:21 to 5/16/90
at 15:38
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air

Sample ID: A-071 (Location 1)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-004
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:02 to 5/16/90
at 15:12
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air

Sample ID: A-079 (Location 11)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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GOLDER ASSOCIATES
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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-005
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:09 to 5/16/90
at 14:05
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air

Sample ID: A-068 (Location 2)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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GOLDER ASSOCIATES
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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-006
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:52 to 5/16/90
at 14:51
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air

Sample ID: A-076 (Location 12)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	RESULTS ppm (vol/vol)
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-007
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:41 to 5/16/90
at 14:40
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/21/90
SAMPLE TYPE: Air

Sample ID: A-073 (Location 9)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	RESULTS <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-008
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:28 to 5/16/90
at 14:24
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air

Sample ID: A-095 (Location 3)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	RESULTS ppm (vol/vol)
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-009

ANALYSES: Sulfur Compounds (CARB 16)

DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:14 to 5/16/90
16:32

DATE SAMPLE REC'D: 5/17/90

DATE ANALYZED: 5/18/90

SAMPLE TYPE: Air

Sample ID: A-069 (Location 7)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-010
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:27 to 5/16/90
at 16:42
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/18/90
SAMPLE TYPE: Air

Sample ID: A-096 (Location 6)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	RESULTS <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-011**ANALYSES: Sulfur Compounds (CARB 16)****DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:50 to 5/16/90
at 16:51****DATE SAMPLE REC'D: 5/17/90****DATE ANALYZED: 5/18/90****SAMPLE TYPE: Air****Sample ID: A-074 (Location 13)****SULFUR COMPOUNDS**

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-012
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:51 to 5/16/90
at 16:00
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/21/90
SAMPLE TYPE: Air

Sample ID: A-072 (Location 8)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	RESULTS <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-013
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:52 to 5/16/90
at 16:50
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/18/90
SAMPLE TYPE: Air

Sample ID: A-077 (Location 5)

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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GOLDER ASSOCIATES
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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

Sample ID: A-070 (Trip)

ANALYSIS NO.: A9013805-014
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: NA
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air

SULFUR COMPOUNDS

<u>COMPOUNDS</u>	<u>RESULTS</u> <u>ppm (vol/vol)</u>
Hydrogen Sulfide	ND(0.02)
Methyl Mercaptan	ND(0.02)
Dimethyl Sulfide	ND(0.02)
Dimethyl Disulfide	ND(0.02)

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 5/15 - 5/16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: GC401-9005171

QC SUMMARY
Sulfur Compounds

<u>Compounds</u>	<u>Laboratory Control Sample % Recovery</u>	<u>Duplicate Control Sample % Recovery</u>	<u>RPD</u>
Hydrogen Sulfide	91	89	2
Methyl Mercaptan	97	93	4
Dimethyl Sulfide	99	99	0
Limit	80 - 115	80 - 115	20

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 5/15 - 5/16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/18/90
SAMPLE TYPE: Air
QC BATCH NO.: GC401-9005181

QC SUMMARY
Sulfur Compounds

<u>Compounds</u>	<u>Laboratory Control Sample % Recovery</u>	<u>Duplicate Control Sample % Recovery</u>	<u>RPD</u>
Hydrogen Sulfide	92	89	4
Methyl Mercaptan	95	93	2
Dimethyl Sulfide	100	99	1
Limit	80 - 115	80 - 115	20

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 5/15 - 5/16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/21/90
SAMPLE TYPE: Air
QC BATCH NO.: GC401-9005211

QC SUMMARY
Sulfur Compounds

<u>Compounds</u>	<u>Laboratory Control Sample % Recovery</u>	<u>Duplicate Control Sample % Recovery</u>	<u>RPD</u>
Hydrogen Sulfide	96	89	8
Methyl Mercaptan	98	93	5
Dimethyl Sulfide	100	99	1
Limit	80 - 115	80 - 115	20

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20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805
ANALYSES: Sulfur Compounds (CARB 16)
DATE SAMPLED: 5/15 - 5/16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: GC401-9005221

QC SUMMARY
Sulfur Compounds

<u>Compounds</u>	<u>Laboratory Control Sample % Recovery</u>	<u>Duplicate Control Sample % Recovery</u>	<u>RPD</u>
Hydrogen Sulfide	95	94	1
Methyl Mercaptan	99	99	0
Dimethyl Sulfide	102	104	2
Limit	80 - 115	80 - 115	20

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Sulfur Compound Stability Study

A 15L Summa passivated stainless steel canister was spiked with a measured volume of a standard gas mixture (Scott Specialty Gas) containing four sulfur compounds (H_2S , methyl mercaptan, dimethyl sulfide, and dimethyl disulfide). A known volume of hydrocarbon free air was added to the canister to simulate an ambient air matrix. The canister used for this study was identical to those used for the Industriplex project sampled from 5/15 to 5/16/90 at 13 sample locations and identified by Enseco analysis number A9013805-001/014. (The canisters were manufactured by the same supplier, from the same lot, and had not been used for previous sampling projects).

The spiked canister was analyzed twice on 6/06/90, and once each on 6/07, 6/08, and 6/13/90. The results are summarized below:

Date	Time	Concentration (ppmv)			
		Hydrogen Sulfide	Methyl Mercaptan	Dimethyl Sulfide	Dimethyl Disulfide
*6-06-90	13:45	2.6	2.9	2.8	2.7
6-06-90	13:55	2.6	2.9	2.9	2.8
6-06-90	18:16	2.6	2.9	2.9	2.9
6-07-90	15:46	2.4	2.7	2.7	2.7
6-08-90	15:33	2.6	2.6	2.7	2.7
6-13-90	15:06	2.4	2.6	2.7	2.8

* Preparation date and time, and theoretical concentration of spiked canister.

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-001
ANALYSES: Volatile Organics by GCMS - EPA T014
DATE SAMPLED: 24 hour composite sample taken from 5/15/90 at 15:10 to 5/16/90 at 15:18
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-075 (Location 10)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114--	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	1.7	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	11	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	21	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	2.0	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

cont...

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GOLDER ASSOCIATES
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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-001
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken at 5/15/90 at 15:10 to 5/16/90
at 15:18
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-075 (Location 10)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results ppb(v/v)</u>	<u>Detection Limit</u>
Toluene-----	9.6	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	6.9	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-002
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:27 to 5/16/90
at 15:48
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-078 (Location 4)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	1.5	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	10	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

cont...

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-002
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:27 to 5/6/90
at 15:48
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-078 (Location 4)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-003
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:21 to 5/16/90
at 15:38
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-071 (Location 1)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	ND	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	7.8	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-003
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:21 to 5/16/90
at 15:38
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-071 (Location 1)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-004
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:02 to 5/16/90
at 15:12
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-079 (Location 11)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114--	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	1.8	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	18	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-004
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:02 to 5/16/90
at 15:12
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-079 (Location 11)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-005
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:09 to 5/16/90
at 14:05
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-068 (Location 2)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	ND	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	ND	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-005
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:09 to 5/16/90
at 14:05
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-068 (Location 2)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIERANALYSIS NO.: A9013805-006
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:52 to 5/16/90
at 14:51
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-076 (Location 12)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	1.5	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	3.4	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-006
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:52 to 5/16/90
at 14:51
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-076 (Location 12)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT**GOLDER ASSOCIATES**

20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-007

ANALYSES: Volatile Organics by GCMS - EPA T014

DATE SAMPLED: 24 hour composite sample taken from 5/15/90 at 14:41 to 5/16/90 at 14:40

DATE SAMPLE REC'D: 5/17/90

DATE ANALYZED: 5/22/90

SAMPLE TYPE: Air

Sample ID: A-073 (Location 9)

QC BATCH NO.: MS101-9005221

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	ND	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	4.0	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

cont...

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-007
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:41 to 5/16/90
at 14:40
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-073 (Location 9)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT**GOLDER ASSOCIATES**

20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-008

ANALYSES: Volatile Organics by GCMS - EPA T014

DATE SAMPLED: 24 hour composite sample taken from 5/15/90 at 14:28 to 5/16/90 at 14:24

DATE SAMPLE REC'D: 5/17/90

DATE ANALYZED: 5/22/90

SAMPLE TYPE: Air

Sample ID: A-095 (Location 3)

QC BATCH NO.: MS101-9005221

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	8.8	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	5.6	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	13	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	5.9	2
Carbon Tetrachloride	ND	2
Benzene-----	4.3	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

cont..

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-008
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 14:28 to 5/16/90
at 14:24
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-095 (Location 3)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	18	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	12	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	4.6	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-009
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:14 to 5/16/90
at 16:32
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-069 (Location 7)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	ND	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	4.2	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-009
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:14 to 5/16/90
at 16:32
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-069 (Location 7)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-010
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:27 to 5/16/90
at 16:42
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-096 (Location 6)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114--	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	1.5	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	3.6	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-010
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:27 to 5/16/90
at 16:42
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-096 (Location 6)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results ppb(v/v)</u>	<u>Detection Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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GOLDER ASSOCIATES
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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-011
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:50 to 5/16/90
at 16:51
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-074 (Location 13)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	ND	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	4.3	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-011
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:50 to 5/16/90
at 16:51
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

Sample ID: A-074 (Location 13)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results ppb(v/v)</u>	<u>Detection Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-012
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:51 to 5/16/90
at 16:00
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-072 (Location 8)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	1.3	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	ND	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-012
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 15:51 to 5/16/90
at 16:00
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-072 (Location 8)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
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Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-013
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:52 to 5/16/90
16:50
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-077 (Location 5)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	3.4	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	ND	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-013
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 24 hour composite sample
taken from 5/15/90 at 16:52 to 5/16/90
at 16:50
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

Sample ID: A-077 (Location 5)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-014
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 5/15 - 16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9005221

Sample ID: A-070 (Trip)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> <u>ppb(v/v)</u>	<u>Detection</u> <u>Limit</u>
Dichlorodifluoromethane-----Freon 12----	ND	2
Chloromethane	ND	2.5
1,2,-Dichloro-1,1,2,2-Tetrafluoroethane--Freon 114---	ND	2
Vinyl Chloride	ND	2.5
Bromomethane-----	ND	3
Chloroethane	ND	5
Trichlorofluoromethane-----Freon 11----	ND	1
cis-1,2-Dichloroethene	ND	2
Carbon Disulfide-----	ND	10
1,1,2-Trichloro-1,2,2-Trifluoroethane Freon 113	ND	2
Acetone-----	ND	10
Methylene Chloride	ND	4
trans-1,2-Dichloroethene-----	ND	4
1,1-Dichloroethane	ND	2.5
Vinyl Acetate-----	ND	2.5
1,1-Dichloroethene	ND	2
2-Butanone-----	ND	3
Chloroform	ND	2
1,1,1,-Trichloroethane-----	ND	2
Carbon Tetrachloride	ND	2
Benzene-----	ND	3
1,2-Dichloroethane	ND	2
Trichloroethene-----	ND	2.5
1,2-Dichloropropane	ND	8
Bromodichloromethane-----	ND	2
cis-1,3-Dichloropropene	ND	3
4-Methyl-2-Pentanone-----	ND	3

cont..

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805-014
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 5/15 - 16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9005221

Sample ID: A-070 (Trip)

Volatile Organics by GCMS - EPA T014

<u>Parameter</u>	<u>Results</u> ppb(v/v)	<u>Detection</u> <u>Limit</u>
Toluene-----	ND	3
trans-1,3-Dichloropropene	ND	3
1,1,2-Trichloroethane-----	ND	3
Tetrachloroethene	ND	3
2-Hexanone-----	ND	5
Dibromochloromethane	ND	3
1,2-Dibromoethane-----	ND	2
Chlorobenzene	ND	2.5
Ethylbenzene-----	ND	2.5
Total Xylenes	ND	5
Styrene-----	ND	7
Bromoform	ND	2
1,1,2,2-Tetrachloroethane-----	ND	4
Benzyl Chloride	ND	2
4-Ethyl Toluene-----	ND	4
1,3,5-Trimethylbenzene	ND	2.5
1,2,4-Trimethylbenzene-----	ND	3
1,3-Dichlorobenzene	ND	3
1,4-Dichlorobenzene-----	ND	4
1,2-Dichlorobenzene	ND	5
1,2,4-Trichlorobenzene-----	ND	7
Hexachlorobutadiene	ND	5

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 5/15 - 16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/17/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005171

QC SUMMARY
Volatile Organics by GCMS
EPA T014

<u>Compounds</u>	<u>Laboratory Control Sample % Recovery</u>	<u>Duplicate Control Sample % Recovery</u>	<u>RPD</u>
Methylene Chloride	90	88	3
1,1 Dichloroethene	92	89	3
Trichloroethene	94	95	1
Toluene	89	88	1
1,1,2,2-Tetrachlorethane	98	102	4
Limits	80 - 115	80 - 115	20

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way; Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 5/15 - 16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS101-9005221

QC SUMMARY
Volatile Organics by GCMS
EPA T014

<u>Compounds</u>	<u>Laboratory Control Sample % Recovery</u>	<u>Duplicate Control Sample % Recovery</u>	<u>RPD</u>
Methylene Chloride	86	87	1
1,1 Dichloroethene	90	92	2
Trichloroethene	96	105	9
Toluene	90	94	4
1,1,2,2-Tetrachlorethane	98	106	9
Limits	80 - 115	80 - 115	20

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LABORATORY REPORT

GOLDER ASSOCIATES
20000 Horizon Way, Ste. 500
Mt. Laurel, NJ 08054
ATTN: MR. BOB GLAZIER

ANALYSIS NO.: A9013805
ANALYSES: Volatile Organics by GCMS -
EPA T014
DATE SAMPLED: 5/15 - 16/90
DATE SAMPLE REC'D: 5/17/90
DATE ANALYZED: 5/22/90
SAMPLE TYPE: Air
QC BATCH NO.: MS201-9005221

QC SUMMARY
Volatile Organics by GCMS
EPA T014

<u>Compounds</u>	<u>Laboratory Control Sample % Recovery</u>	<u>Duplicate Control Sample % Recovery</u>	<u>RPD</u>
Methylene Chloride	98	95	2
1,1 Dichloroethene	92	92	1
Trichloroethene	101	99	1
Toluene	92	96	4
1,1,2,2-Tetrachlorethane	98	107	9
Limits	80 - 115	80 - 115	20

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Location #10



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 1 of 13

Canister Serial # A-075 Date Cleaned 4/27/90 VFR Serial# HT-03

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> $\frac{\text{ml}}{\text{sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \frac{2.0}{7.1} \text{ ml/min}$
	Date <u>5-14-90</u> Initials <u>JK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum
	Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>31</u> inches of Hg vacuum
	Date <u>90-05-15</u> Initials <u>FW/RMG</u>
4) Final vacuum/pressure after sampling	<u>18</u> inches of Hg vacuum
	Date <u>90-05-16</u> Initials <u>EMR</u>
5) Final vacuum/pressure after receipt by lab	<u>6.8 psig = 16</u> inches of Hg vacuum
	Date <u>5-17-90</u> Initials <u>JK</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> $\frac{\text{ml}}{\text{sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \frac{7.0}{7.0} \text{ ml/min}$
	Date <u>5-22-90</u> Initials <u>JK</u>

Relinquished By:

Received by:

Date / Time

Luis Wong

Fcd bx

5/14/90 4PM

Fcd bx

Luis Wong

5/17/90 10PM

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

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LOCATION #4



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 2 of 13

Canister Serial # A-078 Date Cleaned 4/27/90 VFR Serial# HT-08

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> ml x 60 sec = <u>7.2</u> ml/min sec 1 min ^{5-14-90 = 7.4} Date <u>5-14-90</u> Initials <u>JK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>?</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>ENG/EM</u>
4) Final vacuum/pressure after sampling	<u>15</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>EM</u> <u>15-78</u>
5) Final vacuum/pressure after receipt by lab	<u>8.0 psia = 14</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>JK</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> ml x 60 sec = <u>6.6</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>JK</u>

Relinquished By:

Quia Wong
Red BX

Received by:

Red BX
Quia Wong

Date / Time

5/14/90 4PM
5/17/90 10 AM

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

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LOCATION #1

Enseco

Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 3 of 13

Canister Serial # A-071 Date Cleaned 5/2/90 VFR Serial# 11T-09

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> ml x <u>60 sec</u> = <u>7.2</u> ml/min sec 1 min <u>5-14-90</u> = 7.3 Date <u>5-14-90</u> Initials <u>JK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>RMG/EM</u>
4) Final vacuum/pressure after sampling	<u>16</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>EM</u>
5) Final vacuum/pressure after receipt by lab	<u>6.4 psi = 16</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>JK</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> ml x <u>60 sec</u> = <u>7.5</u> ml/min sec 1 min Date <u>5-17-90</u> Initials <u>JK</u>

Relinquished By:

Luis Wong

Fred Bx

Received by:

Fred Bx

Date / Time

5/14/90 4PM

Luis Wong

5/17/90 10am

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LOCATION #11



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 4 of 13

Canister Serial # A-079 Date Cleaned 5/4/90 VFR Serial# HT-10

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> ml x <u>60 sec</u> = <u>7.2</u> ml/min sec 1 min <u>5-14-90</u> = <u>7.1</u> Date <u>5-14-90</u> Initials <u>JX</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>LN</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>RNG/EN</u>
4) Final vacuum/pressure after sampling	<u>16</u> inches of Hg vacuum Date <u>90-05-14</u> Initials <u>EN</u>
5) Final vacuum/pressure after receipt by lab	<u>6.6 pps = 16</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>JX</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> ml x <u>60 sec</u> = <u>7.1</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>JX</u>

Relinquished By:

Luis Wong

Red Box

Received by:

Red Box

Date / Time

5/14/90 4 PM

Luis Wong

5/17/90 10 AM

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Location #2



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 5 of 13

Canister Serial # A-068 Date Cleaned 5/2/90 VFR Serial# HT-11

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> ml x 60 sec = <u>7.0</u> ml/min sec 1 min <u>5-14-90 = 7.0</u> Date <u>5-14-90</u> Initials <u>DK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>3</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>DK</u> <u>RMG</u>
4) Final vacuum/pressure after sampling	<u>16</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>DK</u>
5) Final vacuum/pressure after receipt by lab	<u>7.5 psia</u> <u>15</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>DK</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> ml x 60 sec = <u>6.8</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>DK</u>

Relinquished By:

Received by:

Date / Time

Luis Wong

Red 28

5/14/90 4pm

Red 28

Luis Wong

5/17/90 10am

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

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Locana #12



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 6 of 13

Canister Serial # A-076 Date Cleaned 5/4/90 VFR Serial# HT-13

1) Initial Calibration of VFR (vacuum flow regulator)	<u> </u> ml x <u>60</u> sec = <u>7.2</u> ml/min sec 1 min 5-14-90 = 7.4 Date <u>5-14-90</u> Initials <u>JX</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>RNG/EN</u>
4) Final vacuum/pressure after sampling	<u>18</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>EN</u>
5) Final vacuum/pressure after receipt by lab	<u>9.0</u> psia = <u>12</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>JX</u>
6) Calibration check of VFR after receipt by lab	<u> </u> ml x <u>60</u> sec = <u>8.6</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>JX</u>

Relinquished By:

Luis Wong
Jed BX

Received by:

Jed BX

Date / Time

5/14/90 4pm

Luis Wong

5/17/90 10am

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

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Location #9



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 7 of 13

Canister Serial # A-073 Date Cleaned 5/7/90 VFR Serial# HT-17

1) Initial Calibration of VFR (vacuum flow regulator)	<u>7.1</u> ml x <u>60</u> sec = <u>7.1</u> ml/min sec 1 min <u>5-14-90</u> = <u>7.0</u> Date <u>5-14-90</u> Initials <u>SK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>31</u> inches of Hg vacuum Date <u>9-05-19</u> Initials <u>SK/PMC</u>
4) Final vacuum/pressure after sampling	<u>18</u> inches of Hg vacuum Date <u>9-05-16</u> Initials <u>SK</u> <u>14:40</u>
5) Final vacuum/pressure after receipt by lab	<u>6.0 psia = 18</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>SK</u>
6) Calibration check of VFR after receipt by lab	<u>6.8</u> ml x <u>60</u> sec = <u>6.8</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>SK</u>

Relinquished By:

Lue Wong

Feb 28

Received by:

Feb 28

Date / Time

5/14/90 4pm

Lue Wong

5/17/90 10am

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LOCATION #3



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 8 of 13

Canister Serial # A-095 Date Cleaned 5/7/90 VFR Serial# HT-18

1) Initial Calibration of VFR (vacuum flow regulator)	<u> </u> ml x <u>60 sec</u> = <u>6.9</u> ml/min sec 1 min ⁵⁻¹⁴⁻⁹⁰ = 6.9 Date <u>5-14-90</u> Initials <u>JK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>29</u> ^{HA} <u>ENR</u> inches of Hg vacuum _{INSTR} Date <u>90-05-15</u> Initials <u>ENR/RMG</u>
4) Final vacuum/pressure after sampling	<u>16</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>ENR</u>
5) Final vacuum/pressure after receipt by lab	<u>1.5 psia = 15</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>JK</u>
6) Calibration check of VFR after receipt by lab	<u> </u> ml x <u>60 sec</u> = <u>7.0</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>JK</u>

Relinquished By:

Luis Wong

JKD BX

Received by:

JKD BX

Date / Time

5/14/90 4PM

Luis Wong

5/17/90 10 AM

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

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Location # 7Canister Chain of Custody and
Field Data Record
(Composite Samples)Client Industriplex SitePage 9 of 13Canister Serial # A-069 Date Cleaned 5/7/90 VFR Serial # HT-19

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> ml x 60 sec = <u>7.2</u> ml/min sec 1 min <u>5-14-90 = 7.1</u> Date <u>5-14-90</u> Initials <u>JRK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>SW/RMG</u>
4) Final vacuum/pressure after sampling	<u>18.16</u> inches of Hg vacuum <u>SW</u> <u>90-05-16</u> Date <u>90-05-16</u> Initials <u>SW</u>
5) Final vacuum/pressure after receipt by lab	<u>6.7 psi = 16</u> inches of Hg vacuum <u>16.32</u> Date <u>5-17-90</u> Initials <u>JRK</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> ml x 60 sec = <u>6.9</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>JRK</u>

Relinquished By:

Received by:

Date / Time

Luis Wong
JRKJRK5/14/90 4PMLuis Wong5/17/90 10:10am

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Location #6

Enseco

Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 10 of 13

Canister Serial # A-096 Date Cleaned 5/7/90 VFR Serial # HT-20

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> ml x 60 sec = <u>7.1</u> ml/min sec 1 min = 14-90 = 7.4 Date <u>5-14-90</u> Initials <u>JX</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>RNG/EM</u>
4) Final vacuum/pressure after sampling	<u>15</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>EM</u> <u>EM 900516</u>
5) Final vacuum/pressure after receipt by lab	<u>15</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>JX</u> <u>1.5 psi = 15</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> ml x 60 sec = <u>7.3</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>JX</u>

Relinquished By:

Received by:

Date / Time

Quia Wong

Fed Ex

5/14/90 4pm

Fed Ex

Quia Wong

5/17/90 10am

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Location #13

Canister Chain of Custody and
Field Data Record
(Composite Samples)Client Industriplex SitePage 11 of 13Canister Serial # A-074 Date Cleaned 5/7/90 VFR Serial# HT-21

1) Initial Calibration of VFR (vacuum flow regulator)	<u>7.1</u> ml x <u>60</u> sec = <u>7.1</u> ml/min sec 1 min ⁵⁻¹⁴⁻⁹⁰ 7.3 Date <u>5-14-90</u> Initials <u>SDC</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>RMC/EMM</u>
4) Final vacuum/pressure after sampling	<u>17</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>EMM</u>
5) Final vacuum/pressure after receipt by lab	<u>7.4 p.s.i.e. = 15</u> inches of Hg vacuum Date <u>5-17-90</u> Initials <u>SDC</u>
6) Calibration check of VFR after receipt by lab	<u>6.8</u> ml x <u>60</u> sec = <u>6.8</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>SDC</u>

Relinquished By:

Received by:

Date / Time

Quir Wong
Red BxRed Bx5/14/90 4pmQuir Wong5/17/90 10:00am

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

CFDR

Enseco, Inc. - Air Toxics Laboratory

9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

Location #8



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 12 of 13

Canister Serial # A-A72 Date Cleaned 5/4/90 VFR Serial# HT-22

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> $\frac{\text{ml}}{\text{sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \frac{7.1}{6.9} \text{ ml/min}$	Date <u>5-14-90</u> Initials <u>DK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum	Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum	Date <u>90-05-15</u> Initials <u>RWG/EAN</u>
4) Final vacuum/pressure after sampling	<u>10</u> inches of Hg vacuum	Date <u>90-05-16</u> Initials <u>EW</u>
5) Final vacuum/pressure after receipt by lab	<u>7.4 psia = 1.5</u> inches of Hg vacuum	Date <u>5-17-90</u> Initials <u>DK</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> $\frac{\text{ml}}{\text{sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \frac{6.8}{6.8} \text{ ml/min}$	Date <u>5-22-90</u> Initials <u>DK</u>

Relinquished By:

Luis Wong

Red BR

Received by:

Red BR

Date / Time

5/14/90 9pm

Luis Wong

5/17/90 10am

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

CFDR

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LOCATION #5



Canister Chain of Custody and
Field Data Record
(Composite Samples)

Client Industriplex Site

Page 12 of 13

Canister Serial # A-077 Date Cleaned 5/7/90 VFR Serial# HT-23

1) Initial Calibration of VFR (vacuum flow regulator)	<u>/</u> ml x 60 sec = <u>7.2</u> ml/min sec 1 min $5-14-90 = 7.2$ Date <u>5-14-90</u> Initials <u>JK</u>
2) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum Date <u>5/14/90</u> Initials <u>W</u>
3) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum Date <u>90-05-15</u> Initials <u>SW/RMG</u>
4) Final vacuum/pressure after sampling	<u>12</u> inches of Hg vacuum Date <u>90-05-16</u> Initials <u>SW/P</u>
5) Final vacuum/pressure after receipt by lab	<u>9.1 psia = 11</u> inches of Hg vacuum Date <u>5-18-90</u> Initials <u>JK</u>
6) Calibration check of VFR after receipt by lab	<u>/</u> ml x 60 sec = <u>6.8</u> ml/min sec 1 min Date <u>5-22-90</u> Initials <u>JK</u>

Relinquished By:

Received by:

Date / Time

Quie Wong

JK

5/14/90 4pm

JK

Quie Wong

5/17/90 10am

Note: Numbers 1,2,5,6 are completed by Enseco Lab personnel

CFDR

Enseco, Inc. - Air Toxics Laboratory

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(818) 442-8400 • FAX: (818) 442-3758

THIS MUST BE ANALYZED

Canister Chain of Custody and
Field Data Record
(Grab Samples)

Client Industriplex Site

Canister Serial # A-070

Page 1 of 1

Date Cleaned 5/7/90

Trip Blank - DO NOT ANALYZE.

1) Initial vacuum check of canister	<u>30</u> inches of Hg vacuum	Date <u>5/14/90</u>	Initials <u>W</u>
2) Field vacuum check before sampling	<u>30</u> inches of Hg vacuum	Date <u>9/15/15</u>	Initials <u>EM</u>
3) Final vacuum/pressure after sampling	<u>0.3 psi = 29</u> inches of Hg vacuum	Date <u>5-18-90</u>	Initials <u>JK</u>
4) Final vacuum/pressure after receipt by lab	<u>0.3 psi = 29</u> inches of Hg vacuum	Date <u>5-18-90</u>	Initials <u>JK</u>

Relinquished By:

Luis Wong
TRD BR

Received by:

TRD BR

Date / Time

5/14/90 9pm

Luis Wong

5/17/90 10am

Note: Numbers 1 & 4 are completed by Enseco Lab personnel

CDFR1

Enseco, Inc. - Air Toxics Laboratory

9537 Telstar Avenue, Suite 118 • El Monte, CA 91731
(818) 442-8400 • FAX: (818) 442-3758

CLIENT <u>GOLDER ASSOCIATES</u> ADDRESS <u>MT LAUREL NJ 08054</u> <u>ISBT - (A-1) Room #1</u> PROJECT NAME _____ CONTRACT / PURCHASE ORDER / QUOTE # _____	PROJECT MANAGER <u>K. Moreside</u> PHONE NUMBER <u>(609) 273-1116</u> SITE CONTACT <u>[Signature]</u>
--	---

Sample No. / Identification	Date	Time	CHARACTER Lab Sample Number	SAMPLE TYPE			No. of Containers	ANALYSES				COMPARATED Sample Condition/ REMARKS							
				LIQ.	AIR	SOLID		As Recd	H ₂ O	Aluminum	Chloride	Copper	Iron	Manganese	Nickel	Sulfur	Zinc		
LOCATION 2	9-15-16		A-068		✓		1	✓	✓	✓	✓							14:09	14:05
3			A-069		✓		1	✓	✓	✓	✓							14:28	14:24
9			A-073		✓		1	✓	✓	✓	✓							14:41	14:40
12			A-076		✓		1	✓	✓	✓	✓							14:52	14:51
11			A-079		✓		1	✓	✓	✓	✓							15:02	15:12
10			A-075		✓		1	✓	✓	✓	✓							15:10	15:18
1			A-071		✓		1	✓	✓	✓	✓							15:21	15:38
4			A-078		✓		1	✓	✓	✓	✓							15:27	15:48
8			A-072		✓		1	✓	✓	✓	✓							15:51	16:00
✓ 7			A-064		✓		1	✓	✓	✓	✓							16:14	16:32

SAMPLERS: (Signature)	Received by: (Signature)	Date	Time	The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Enseco Terms and Conditions, unless a contract or purchase order has been executed and is cited above.		
Relinquished by: (Signature)	Received by: (Signature)	Date	Time			
Relinquished by: (Signature)	Date	Time	Received for Laboratory by:			
Method of Shipment:		Date RECEIVED		Time	Date ACCEPTED	Time
Special Instructions:		SAMPLE DISPOSITION:				
<u>24 Hr Composite samples - Locations #1-13</u> <u>72 Hr 1600 Time per samples</u>		1. Storage time requested: _____ days (Samples will be stored for 30 days without additional charges; thereafter storage charges will be billed at the published rates.)				
		2. Sample to be returned to client: <u>Y</u> <u>N</u> (Enseco will dispose of unreturned samples at no extra charge. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)				



☐ 7440 Lincoln Way, Garden Grove, CA 92641, (714) 898-6370
☐ 2810 Bunsen Ave., Unit A Ventura, CA 93003, (805) 650-0546
☐ 2325 Skyway Dr., Unit K, Santa Maria, CA 93455, (805) 922-2776
☒ 9537 Telfar Ave., Unit 118, El Monte, CA 91731, (818) 442-8400
☐ Mobile Labs, (800) ENSECO-8

CHAIN OF CUSTODY RECORD

Date 90-05-16 Page 2 of 2
Lab Number A9013805-cc/Vol

CLIENT <u>GOLDER ASSOCIATES</u>				PROJECT MANAGER <u>K. Moore / J. Baker</u>				ANALYSES <div style="display: flex; justify-content: space-around;"><div>WAS</div><div>H₂S</div><div>MERCAPTANS</div><div>METHANE</div></div>									
ADDRESS <u>MT. LAMAR NJ 08051</u>				PHONE NUMBER <u>609 273 1110</u>													
PROJECT NAME <u>ISRT - (A-I) Round 1</u>				SITE CONTACT <u>E. Ford</u>													
CONTRACT / PURCHASE ORDER / QUOTE #																	
Sample No. / Identification	Date	Time	Lab Sample Number	SAMPLE TYPE			No. of Containers	ANALYSES								Sample Condition / REMARKS	
				LIQ.	AIR	SOLID		WAS	H ₂ S	MERCAPTANS	METHANE						
LOCATION 6	90-05-16		A-096		✓		1	✓	✓	✓	✓				16:27	16:42	
LOCATION 5			A-077		✓		1	✓	✓	✓	✓				16:52	16:50	
LOCATION 13			A-074		✓		1	✓	✓	✓	✓				16:50	16:51	
SILVER BLANK			A-052		✓		1	✓	✓	✓	✓				GA/14- spike		
Top Blank			A-070		✓		1	✓	✓	✓	✓				GA/14-		
SAMPLERS: (Signature)				Received by: (Signature)				Date	Time	The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Enseco Terms and Conditions, unless a contract or purchase order has been executed and is cited above.							
Relinquished by: (Signature)				Received by: (Signature)				Date	Time								
Relinquished by: (Signature)				Date	Time	Received for Laboratory by:				Date	RECEIVED	Time	Date	ACCEPTED	Time		
N/A				90-05-16	18:00	Duke Woy				5/17/90	10:10am						
Method of Shipment: <u>INDEX</u>				SAMPLE DISPOSITION: 1. Storage time requested: <u>30</u> days (Samples will be stored for 30 days without additional charges; thereafter storage charges will be billed at the published rates.) 2. Sample to be returned to client: <u>Y</u> <u>N</u> (Enseco will dispose of unreturned samples at no extra charge. Disposal will be by incineration wherever possible; otherwise, as appropriate, according to legal requirements.)													
Special Instructions: <u>24 hr Composite Sampling Locations #1-13</u> <u>72 hr Hold Time for Analyses</u>																	

AnalytiKEM An American NuKEM Company

AnalytiKEM Inc.
28 Springdale Road
Cherry Hill, NJ 08003
609/751-1122
215/923-2068

Client: ENSECO Inc.

Date: June 19, 1990

Address: 2200 Cottontail Lane
Somerset, NJ 08873

Project No.: A22073

Date Submitted: June 8, 1990

Contact: Renee Cohen

Project: Air Filters

Analytical Results

Metals

<u>Sample Designation</u>	<u>Parameter</u>		
	<u>Arsenic, total</u>	<u>Chromium, total</u>	<u>Lead, total</u>
Method Blank	5.0 U	0.4 U	2.5 U
A22073-1 7793-0001	5.0 U	0.4 U	2.5 U
A22073-2 7793-0002	5.0 U	0.4 U	2.5 U
A22073-3 7793-0003	5.0 U	0.4 U	2.5 U
A22073-4, 7793-0004	5.0 U	0.4 U	2.5 U
A22073-5 7793-0005	5.0 U	0.4 U	2.5 U
A22073-6 7793-0006	5.0 U	0.4 U	2.5 U
A22073-7 7793-0007	5.0 U	0.4 U	2.5 U
A22073-8 7793-0008	5.0 U	0.4 U	2.5 U
A22073-9 7793-0009	5.0 U	0.4 U	2.5 U
A22073-10 7793-0010	5.0 U	0.4 U	2.5 U
A22073-11 7793-0011	5.0 U	0.4 U	2.5 U
A22073-12 7793-0012	5.0 U	0.4 U	2.5 U
A22073-13 7793-0013	5.0 U	0.4 U	2.5 U
A22073-14 7793-Blank-0014	5.0 U	0.4 U	2.5 U
Units	(ug)	(ug)	(ug)

U - Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.

Quality Control Data

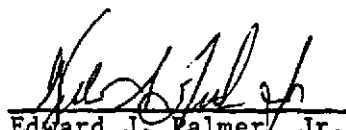
AnalytiKEM

Metals

Nonaqueous Matrix Spike/Matrix Spike Duplicate Recovery Data

<u>Parameter</u>	<u>Amount of Spike</u>	<u>Sample Spiked</u>	
		A22073-15, A22073-16	
		<u>MS</u>	<u>MSD</u>
Arsenic	500	30	43
Arsenic †	500	94	--
Chromium	500	23	33
Chromium †	500	82	--
Lead	500	13	39
Lead †	500	87	--
Units	(ug)	(%)	(%)

† DI Water Spike


Edward J. Palmer, Jr.
Technical Manager

EP/dp

CHAIN-OF-CUSTODY RECORD



PAGE 1 OF 2

LABOR (Signature)		DATE SHIPPED 6/7/90	CARRIER FedEx	
PHONE (201) 469-5800		AIRBILL NO.		COOLER NO.
Enseco East 2200 Cottontail Lane Somerset, NJ 08873 (201) 469-5800 (201) 469-7516 Fax #.		SEND RESULTS TO		
		CLIENT NAME En Sample Management		
		COMPANY Analytikem		
		ADDRESS 28 Springdale Rd Bldg 21 Cherry Hill NJ 08003		
ATTENTION Eni		PHONE NO. 609-751-1122		
PROJECT NAME ENSECO-East - 7793		PROJECT NO.		P.O. NO.
RELINQUISHED BY (Signature) RC Parnow		RECEIVED BY (Signature) FedEx # 1116, 1117		DATE 6/7/90
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)		TIME 18:00
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)		DATE
RELINQUISHED FROM LAB BY (Signature)		RECEIVED BY (Signature)		TIME

ANALYSIS REQUEST

SAMPLE ID NO.	SAMPLE DESCRIPTION	DATE / TIME SAMPLED	ANALYSIS REQUESTED	SAMPLE CONDITION UPON RECEIPT
7793-0001	Filter Cassette		Total DUST + Calc. NIOSH 7300 - As, Cs, Pb	
7793-0002	"		"	
-0003	"		"	
-0004	"		"	
-0005	"		"	
-0006	"		"	
-0007	"		"	
-0008	"		"	
-0009	"		"	
0010	"		"	

SPECIAL INSTRUCTIONS / COMMENTS:

NOTE: UNUSED PORTIONS OF NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT.

EXPECTED ANALYTICAL T.A.T.'S	Immediate Attention (200% Surcharge)	RUSH (50-100% Surcharge)	Standard
------------------------------	--------------------------------------	--------------------------	----------

ENSECO EAST LOG NUMBER (lab use only)

CHAIN-OF-CUSTODY RECORD



PAGE 2 OF 2

SAMPLER: (Signature)

DATE SHIPPED

6/7/90

CARRIER

FedEx

PHONE

AIRBILL NO.

COOLER NO.

SHIP TO	Enseco East 2200 Cottontail Lane Somerset, NJ 08873 (201) 469-5800 (201) 469-7516 Fax #.	SEND RESULTS TO	CLIENT NAME Sample Management Office
			COMPANY AnalytiKEM
			ADDRESS 28 Springdale Rd Bldg 21 Cherry Hill, NJ 08003
			PHONE NO. 201-609-7511-1122
ATTENTION Renee Cohen			
PROJECT NAME ENSECO - East		PROJECT NO. 7793	P.O. NO.

RELINQUISHED BY (Signature) A. Cohen	RECEIVED BY (Signature) FedEx	DATE 6/7/90	TIME 18:00
RELINQUISHED BY (Signature)	RECEIVED BY (Signature)	DATE	TIME
RELINQUISHED BY (Signature)	RECEIVED BY (Signature)	DATE	TIME
RELINQUISHED FROM LAB BY (Signature)	RECEIVED BY (Signature)	DATE	TIME

ANALYSIS REQUEST

SAMPLE ID NO.	SAMPLE DESCRIPTION	DATE / TIME SAMPLED	ANALYSIS REQUESTED	SAMPLE CONDITION UPON RECEIPT
7793-0011	filter Cassettes		Total DUST CATC. NIOSH 7300, As, Cr, Pb	
0012	"		"	
0013	"		"	
0014	"		"	
7793-BIR(4)	filter Cassettes		NIOSH 7300 As, Cr, Pb	
7793-M9(5)	"		"	
7793-M50(16)	"		"	

SPECIAL INSTRUCTIONS / COMMENTS:

NOTE: UNUSED PORTIONS OF NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT.

EXPECTED ANALYTICAL T.A.T.'S	Immediate Attention (200% Surcharge)	RUSH (50-100% Surcharge)	Standard

ENSECO EAST LOG NUMBER (lab use only)

ENS-1045

Client Retains White Copy Only

APPENDIX B

DUST PUMP FIELD CALIBRATION
AND SAMPLING DOCUMENTATION

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 1 SAMPLER NAME: E. Auer

LOCATION DESCRIPTION [Address]: CITY LANDFILL, Woburn
[New Orleans Resin and Paints]

DATE STARTED: 90-05-15 TIME STARTED: 15.21

DATE COMPLETED: 90-05-16 TIME COMPLETED: 15.37

PUMP SERIAL NO.: 516376 RECORDED TARE OF FILTER: 335 wt/mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 55

REQUIRED FLOW RATE (ml/min): 2000 ± 1.43%

INTERMITTENT PUMPING REQUIRED: ✓ YES NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Partly Cloudy, 70°F
Sunny Windy, Damp - Rain Tape Recorder OFF

OBSERVATIONS: Tree Location

C:FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 2 SAMPLER NAME: E. Auer

LOCATION DESCRIPTION [Address]: Underground Water

DATE STARTED: 90-05-15 TIME STARTED: 14:09

DATE COMPLETED: 90-05-16 TIME COMPLETED: 14:00

PUMP SERIAL NO.: 516542 RECORDED TARE OF FILTER: 33.7 g/mg

INITIAL ROTAMETER READING: 50

FINAL ROTAMETER READING: 53

REQUIRED FLOW RATE (ml/min): 2000 ± 1037

INTERMITTENT PUMPING REQUIRED: ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: 5/8
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Cloudy - Winds from West (10-20 mi/hr.)

OBSERVATIONS: Rock Settle

C:FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 3

SAMPLER NAME: E. AUSA

LOCATION DESCRIPTION [Address]: Town of Reading, Conservation Lands

DATE STARTED: 90-05-15

TIME STARTED: 14:28

DATE COMPLETED: 90-05-16

TIME COMPLETED: 14:26

PUMP SERIAL NO.: 516524

RECORDED TARE OF FILTER: 33.7 g

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 51

REQUIRED FLOW RATE (ml/min): 200 ± 1.63%

INTERMITTENT PUMPING REQUIRED: / YES NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Cloudy, Overcast

OBSERVATIONS: TREE LOCATION
Swampy, Wetlands Area - Mucky Soils

C:FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 4

SAMPLER NAME: E. ALDA

LOCATION DESCRIPTION [Address]: PK Realty Trust, 216 New Boston Street, Wob.

DATE STARTED: 90-05-15

TIME STARTED: 15:27

DATE COMPLETED: 90-05-16

TIME COMPLETED: 15:47

PUMP SERIAL NO.: 516551

RECORDED TARE OF FILTER: 31.3 wt/mg

INITIAL ROTAMETER READING: 50

FINAL ROTAMETER READING: 55

REQUIRED FLOW RATE (ml/min): 2000 \pm 163%

INTERMITTENT PUMPING REQUIRED: ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Partly Cloudy - 70°F
BEGINNING TO RAIN

OBSERVATIONS: Tree Location (off-of-fence area)

C: FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 5

SAMPLER NAME: E. Audit

LOCATION DESCRIPTION [Address]: ISST INTERIM Custodial Trust

(East of East Tide Pier)

DATE STARTED: 90-05-15

TIME STARTED: 16:52

DATE COMPLETED: 90-05-16

TIME COMPLETED: 16:50

PUMP SERIAL NO.: 516524

RECORDED TARE OF FILTER: 37.2 wt/mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 57

REQUIRED FLOW RATE (ml/min): 200 ± 1.63%

INTERMITTENT PUMPING REQUIRED: ✓ YES NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A

2. SAMPLE PERIOD [Total time - min.]: 1440

3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Partly Cloudy, Increased Winds

OBSERVATIONS: Real Location

C: FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 6

SAMPLER NAME: C. Avat

LOCATION DESCRIPTION [Address]: 1247 Interim (Industrial) Truss

(End of Commercial City Extension)

DATE STARTED: 90-05-15

TIME STARTED: 16:27

DATE COMPLETED: 90-05-16

TIME COMPLETED: 16:43

PUMP SERIAL NO.: 516355

RECORDED TARE OF FILTER: 56.2 wt./mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 52

REQUIRED FLOW RATE (ml/min): 2000 \pm 1.63%

INTERMITTENT PUMPING REQUIRED: ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A

2. SAMPLE PERIOD [Total time - min.]: 1440

3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Partly Cloudy, Windy

OBSERVATIONS: Rocky terrain

(Close to old trailers on-site)

C: FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 7

SAMPLER NAME: E. And.

LOCATION DESCRIPTION [Address]: ISRT INTERIM CUSTOMER TEST

(NE CORNER OF SITE)

DATE STARTED: 90-05-15

TIME STARTED: 16:44

DATE COMPLETED: 90-05-16

TIME COMPLETED: 16:34

PUMP SERIAL NO.: 516389

RECORDED TARE OF FILTER: 36.241 mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 54

REQUIRED FLOW RATE (ml/min): 2000 \pm 1.63%

INTERMITTENT PUMPING REQUIRED: ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: n/a
2. SAMPLE PERIOD [Total time - min.]: 14:10
3. PUMP PERIOD [Total time - min.]: 4:50

WEATHER: Partly Sunny, Breezy

OBSERVATIONS: Rock Settles
Nearby Highway Traffic

C:FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 8

SAMPLER NAME: C Audit

LOCATION DESCRIPTION [Address]: Woburn Industrial Associates (*)

DATE STARTED: 90-05-15

TIME STARTED: 15:51

DATE COMPLETED: 90-05-16

TIME COMPLETED: 16:01

PUMP SERIAL NO.: 516388

RECORDED TARE OF FILTER: 36.504 /mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 54

REQUIRED FLOW RATE (ml/min): $200 \pm 163\%$

INTERMITTENT PUMPING REQUIRED: ☒ YES NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Partly Cloudy, Windy

OBSERVATIONS: Rock. Settler
② "Depth" non-settler

C:FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 9 SAMPLER NAME: CADZ

LOCATION DESCRIPTION [Address]: ALICE BARROWS SCHOOL, READING

DATE STARTED: 90-05-15 TIME STARTED: 14:41

DATE COMPLETED: 90-05-16 TIME COMPLETED: 14:42

PUMP SERIAL NO.: 510510 RECORDED TARE OF FILTER: 36.6 μ g/mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 53

REQUIRED FLOW RATE (ml/min): $200 \pm 1.63\%$

INTERMITTENT PUMPING REQUIRED: ☒ YES NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A

2. SAMPLE PERIOD [Total time - min.]: 1440

3. PUMP PERIOD [Total time - min.]: 480

WEATHER: SUNNY

OBSERVATIONS: RAW LOCATION - ATTACHED TO WINDOW SCREEN
VIA ROPE

C:FPDFFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 10

SAMPLER NAME: C. Auda

LOCATION DESCRIPTION [Address]: Veteran's Memorial Center, Woburn

DATE STARTED: 90-05-15

TIME STARTED: 15:10

DATE COMPLETED: 90-05-16

TIME COMPLETED: 15:20

PUMP SERIAL NO.: 516028

RECORDED TARE OF FILTER: 56.8 g/mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 54

REQUIRED FLOW RATE (ml/min): 200 \pm 1.63%

INTERMITTENT PUMPING REQUIRED: YES ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Sunny

OBSERVATIONS: "Jungle Gym" Play Yard
Surrounding Construction Site, Cement Truck - Diesel Fumes

C: FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 11

SAMPLER NAME: E. Audit

LOCATION DESCRIPTION [Address]: 16 Post Office, Washington Street

DATE STARTED: 90-05-15

TIME STARTED: 15:02

DATE COMPLETED: 90-05-16

TIME COMPLETED: 15:10

PUMP SERIAL NO.: 516395

RECORDED TARE OF FILTER: 3.7 uH/mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 51

REQUIRED FLOW RATE (ml/min): 200 \pm 1.63%

INTERMITTENT PUMPING REQUIRED: ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: 2hr
2. SAMPLE PERIOD [Total time - min.]: 14hr
3. PUMP PERIOD [Total time - min.]: 48hr

WEATHER: Partly Cloudy - Variable Sun

OBSERVATIONS: Tree Location
Lawn Cutting Nearby

C:FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 12 SAMPLER NAME: E Aug

LOCATION DESCRIPTION [Address]: Eaton School, Reading

DATE STARTED: 9-05-15 TIME STARTED: 14:52

DATE COMPLETED: 9-05-16 TIME COMPLETED: 14:55 *

PUMP SERIAL NO.: 516393 RECORDED TARE OF FILTER: 36.7 wt./mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 54

REQUIRED FLOW RATE (ml/min): $2000 \pm 1.63\%$

INTERMITTENT PUMPING REQUIRED: ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Sunny, Breezy

OBSERVATIONS: Tree Located
* Pump Has Failed from Tree - No Physical Evidence of Tampering

C:FPFDFORM

PRE-DESIGN INVESTIGATION
INDUSTRI-PLEX SITE
WOBURN, MASSACHUSETTS

FLOW PUMP FIELD DATA FORM

PROJECT NO.: 893-6255

LOCATION NO.: 13

SAMPLER NAME: C. AUST

LOCATION DESCRIPTION [Address]:

ISCT INTERIM CUSTODIAN TRUST
(East of East #100 Pine)

DATE STARTED: 90-05-15

TIME STARTED: 16:50

DATE COMPLETED: 90-05-16

TIME COMPLETED: 16:51

PUMP SERIAL NO.: 516569

RECORDED TARE OF FILTER: 36.7 wt/mg

INITIAL ROTAMETER READING: 56

FINAL ROTAMETER READING: 56

REQUIRED FLOW RATE (ml/min): 2000 \pm 16.3%

INTERMITTENT PUMPING REQUIRED: ☒ YES ☐ NO

PUMP PROGRAMMING:

1. DELAYED START [Time started - min.]: N/A
2. SAMPLE PERIOD [Total time - min.]: 1440
3. PUMP PERIOD [Total time - min.]: 480

WEATHER: Partly Cloudy, Increased Winds

OBSERVATIONS: Tras Location
(Duplicate of #5)

C:FPDFFORM

APPENDIX C
METEOROLOGICAL DATA

INDUSTRI-PLEX SITE WOBURN, MA
WEATHER STATION DATA
MAY 15 TO MAY 16, 1990

YEAR	DAY	TIME	AVG WIND SPEED (MPH)	AVG WIND DIR (DEG)	SIGMA WIND DIR (DEG)	AVG TEMP (DEG F)	AVG HUM (%)*	AVG PRESS (in Hg)	BAT VOLT (VDC)
1990	135	1400	10.16	218.8	23.67	74.8	28.21	29.97	14.12
1990	135	1415	9.13	252.3	18.72	74.7	27.16	29.97	14.12
1990	135	1430	8.5	238.2	20.29	75.3	26.79	29.96	14.12
1990	135	1445	10.26	216.9	24.01	75.9	26.03	29.95	14.12
1990	135	1500	8.81	226.1	24.92	75.7	24.96	29.95	14.12
1990	135	1515	9.8	239.1	24.3	76.8	24.52	29.94	14.12
1990	135	1530	10.94	238	16.51	75.7	23.51	29.94	14.12
1990	135	1545	8.47	230.9	26.06	76.6	23.94	29.92	14.12
1990	135	1600	11.55	242.4	19.32	75.5	24.27	29.93	14.12
1990	135	1615	10.1	237.4	14.96	76.4	24.36	29.93	14.12
1990	135	1630	12.66	242.5	19.33	74.9	23.98	29.94	14.12
1990	135	1645	9.21	238	20.4	74.5	24.77	29.94	14.13
1990	135	1700	10.31	235.1	19.15	74.9	24.96	29.94	14.13
1990	135	1715	10.83	241.8	17.01	75.2	24.47	29.94	14.13
1990	135	1730	11.3	229.5	18.51	75	24.04	29.95	14.12
1990	135	1745	11.83	240.9	15.88	74.3	24.57	29.95	14.13
1990	135	1800	11.18	235.6	14.22	73.9	24.99	29.95	14.13
1990	135	1815	11.74	238.1	14.31	73.6	24.74	29.95	14.13
1990	135	1830	11.42	231.4	16.83	72.8	24.93	29.96	14.13
1990	135	1845	8.79	223.6	17.5	72.4	25.46	29.96	14.13
1990	135	1900	7.8	225.5	17.57	72.1	25.52	29.97	14.13
1990	135	1915	9.61	223.4	18.53	71.4	25.89	29.98	14.13
1990	135	1930	11.73	241.9	15.49	70.6	26.04	29.99	14.13
1990	135	1945	9.21	236.4	13.33	70	26.08	30	14.14
1990	135	2000	6.34	221.7	15.96	69.22	27	30.01	14.13
1990	135	2015	6.35	220.8	17.66	68.7	28.14	30.02	14.13
1990	135	2030	7.98	222.7	17.24	68.21	29	30.03	14.13
1990	135	2045	7.16	211.6	14.4	67.52	29.38	30.03	14.13

INDUSTRI-PLEX SITE WOBURN, MA
 WEATHER STATION DATA
 MAY 15 TO MAY 16, 1990

YEAR	DAY	TIME	AVG WIND SPEED (MPH)	AVG WIND DIR (DEG)	SIGMA WIND DIR (DEG)	AVG TEMP (DEG F)	AVG HUM (%)*	AVG PRESS (in Hg)	BAT VOLT (VDC)
1990	135	2100	6.817	212.8	16.66	66.89	30.03	30.04	14.14
1990	135	2115	8.06	220.2	16.31	66.43	30.07	30.04	14.14
1990	135	2130	8.06	221.7	16.35	65.92	30.1	30.04	14.14
1990	135	2145	7.68	205.6	15.41	65.36	30.3	30.04	14.14
1990	135	2200	6.419	214.1	17.96	64.7	31.08	30.04	14.14
1990	135	2215	6.979	215.7	16.89	64	31.72	30.04	14.14
1990	135	2230	6.957	210.5	16.58	63.4	32.98	30.04	14.14
1990	135	2245	6.342	211.3	16.92	62.85	34.45	30.05	14.14
1990	135	2300	6.897	213.3	16.78	62.23	36.22	30.04	14.14
1990	135	2315	6.443	232.5	13.84	61.6	38.53	30.05	14.14
1990	135	2330	5.693	226.5	16.75	60.94	41.49	30.05	14.14
1990	135	2345	5.873	223.1	18.25	60.45	44.62	30.05	14.14
1990	136	0	6.443	219.5	15.74	60.09	47.24	30.05	14.14
1990	136	15	6.503	220	16.55	59.61	49.87	30.05	14.14
1990	136	30	6.538	217.8	16.69	59.23	51.92	30.05	14.15
1990	136	45	6.643	212.7	16.05	58.91	53.2	30.05	14.15
1990	136	100	6.237	220.7	18.44	58.64	54.48	30.05	14.15
1990	136	115	6.951	224.5	16.3	58.58	55.43	30.05	14.15
1990	136	130	6.121	214.6	20.96	58.25	56.76	30.04	14.15
1990	136	145	6.269	219	18.68	57.97	57.29	30.03	14.15
1990	136	200	5.433	219.9	16.71	57.7	58.31	30.03	14.15
1990	136	215	4.939	221.2	18.42	57.57	59.29	30.03	14.15
1990	136	230	5.898	232.1	15.77	57.35	59.97	30.02	14.15
1990	136	245	5.893	235.5	14.56	57.04	60.88	30.03	14.15
1990	136	300	5.368	214.7	18.78	56.65	61.81	30.03	14.15
1990	136	315	4.875	223.6	15.56	56.39	62.56	30.02	14.15
1990	136	330	4.101	214.3	18.4	56.17	63.66	30.02	14.15
1990	136	345	3.724	221.1	18.21	56.21	64.76	30.02	14.15

INDUSTRI-PLEX SITE WOBURN, MA
 WEATHER STATION DATA
 MAY 15 TO MAY 16, 1990

YEAR	DAY	TIME	AVG WIND SPEED (MPH)	AVG WIND DIR (DEG)	SIGMA WIND DIR (DEG)	AVG TEMP (DEG F)	AVG HUM (%) *	AVG PRESS (in Hg)	BAT VOLT (VDC)
1990	136	400	4.622	227.4	17.01	56.17	65.68	30.02	14.15
1990	136	415	4.619	235.3	15.2	56.04	66.27	30.02	14.14
1990	136	430	3.18	254.4	23.33	55.74	67.54	30.02	14.14
1990	136	445	3.237	259.6	29.35	55.61	68.79	30.03	14.14
1990	136	500	3.598	219.5	16.17	55.72	69.53	30.02	14.14
1990	136	515	4.243	224.4	14.81	55.76	69.85	30.03	14.14
1990	136	530	4.751	217.4	16.85	55.7	70.6	30.03	14.15
1990	136	545	4.474	221	19.05	55.7	71.9	30.04	14.15
1990	136	600	4.208	222.4	19.91	55.75	72.5	30.04	14.15
1990	136	615	3.713	213.9	18.2	55.83	73.4	30.05	14.15
1990	136	630	5.167	223.7	16.19	55.91	74.2	30.05	14.14
1990	136	645	4.181	229.1	16.39	55.99	75.1	30.05	14.14
1990	136	700	4.169	226	16.32	56.11	75.5	30.05	14.15
1990	136	715	4.078	228.3	15.9	56.39	76.2	30.04	14.15
1990	136	730	3.091	233.1	20.23	56.71	76.2	30.04	14.15
1990	136	745	2.854	215.6	20.81	57.04	76.2	30.04	14.15
1990	136	800	3.034	225.8	24.89	57.67	76.2	30.04	14.15
1990	136	815	5.149	232.2	15.26	57.96	75.4	30.04	14.15
1990	136	830	4.417	241.8	19.83	58.39	75.2	30.04	14.15
1990	136	845	4.779	249.2	16.31	58.58	75.2	30.03	14.15
1990	136	900	4.786	263.9	19.29	59.01	75.2	30.03	14.15
1990	136	915	3.987	256.9	22.23	59.35	75.2	30.03	14.15
1990	136	930	3.75	241.4	26.55	59.58	74.8	30.02	14.15
1990	136	945	3.082	237.9	33.63	60.14	74.2	30.02	14.15
1990	136	1000	2.891	283.2	22.2	60.72	74.2	30.01	14.15
1990	136	1015	4.156	298.2	24.11	60.43	74.2	30	14.15
1990	136	1030	2.798	19.7	17.17	60.71	74	30	14.15
1990	136	1045	2.807	6.168	37.72	61.75	72.6	30	14.15

INDUSTRI-PLEX SITE WOBURN, MA
 WEATHER STATION DATA
 MAY 15 TO MAY 16, 1990

YEAR	DAY	TIME	AVG WIND SPEED (MPH)	AVG WIND DIR (DEG)	SIGMA WIND DIR (DEG)	AVG TEMP (DEG F)	AVG HUM (%) *	AVG PRESS (in Hg)	BAT VOLT (VDC)
1990	136	1100	2.516	347	40.39	62.42	71.2	30	14.15
1990	136	1115	3.158	331.3	28.62	62.33	69.53	29.99	14.15
1990	136	1130	4.389	36.86	21.93	62.53	69.27	29.99	14.15
1990	136	1145	3.021	61.67	33.93	63.18	68.45	29.99	14.14
1990	136	1200	2.219	52.6	51.73	63.56	67.8	29.98	14.14
1990	136	1215	3.386	93.1	33.51	63.64	67.09	29.97	14.14
1990	136	1230	3.863	110.5	32.14	63.85	66.29	29.96	14.14
1990	136	1245	4.534	109.8	24.64	64.63	65.28	29.95	14.14
1990	136	1300	4.766	91.5	41.58	64.46	63.2	29.94	14.14
1990	136	1315	3.766	102.6	32.71	64.38	62.42	29.94	14.14
1990	136	1330	3.515	102.9	28.87	64.49	62.39	29.94	14.14
1990	136	1345	3.918	80.3	18.25	63.86	62.39	29.94	14.14
1990	136	1400	3.74	100.7	31.72	63.4	62.77	29.95	14.14
1990	136	1415	5.055	121.4	18.52	62.75	67.18	29.95	14.13
1990	136	1430	5.12	119.7	20.17	62.24	69.11	29.96	14.14
1990	136	1445	5.212	110.8	18.44	61.76	70.1	29.96	14.14
1990	136	1500	4.932	93.8	19.75	61.51	71.1	29.96	14.14
1990	136	1515	6.197	57.1	18.38	61.09	71.2	29.95	14.14
1990	136	1530	5.958	58.02	17.53	59.56	70.3	29.95	14.14
1990	136	1545	3.961	59.88	16.6	58.86	72.7	29.96	14.15
1990	136	1600	4.394	55.09	13.95	58.25	74.4	29.96	14.15
1990	136	1615	4.501	56.72	14.88	57.41	76.1	29.96	14.15
1990	136	1630	4.167	55.99	15.15	56.69	78.7	29.96	14.15
1990	136	1645	4.442	51.39	15.97	55.77	81.7	29.96	14.15
1990	136	1700	4.267	54.23	17.66	54.75	84.5	29.96	14.15

* Humidity data from weather station should be considered estimated pending corrective action from audit report.

APPENDIX D
METEOROLOGICAL STATION AUDIT REPORT

**CHAS. T. MAIN, INC.**

PRUDENTIAL CENTER, BOSTON, MASSACHUSETTS 02199 • TELEPHONE 617 262-3200 • TELEX 4430035 • FAX 617 859-2575

June 18, 1990

JUN 20 1990

Mr. Robert Glazier
Golder Associates
20000 Horizon Way
Suite 500
Mt. Laurel, N. J. 08054

**SUBJECT: Industri-Plex Hazardous Waste Remediation Site
 Meteorological Monitoring System Audit Results**

Dear Mr. Glazier:

On April 24, 1990 Chas. T. Main, Inc. (MAIN) conducted a system start-up performance audit on the Industri-Plex hazardous waste remediation site meteorological monitoring system. The audit was conducted according to the procedures described in the Quality Assurance Handbook for Air Pollution Measurement Systems - Volume IV - Meteorological Measurements: EPA 600/4-82-60, August 1989, and the On-Site Meteorological Program Guidance for Regulatory Modeling Applications: EPA 450/4 - 87-013, June 1987.

The audit results for the wind speed, wind direction, pressure, and temperature systems were determined to be within quality assurance guideline acceptability limits. The relative humidity sensor however, was found to be operating outside of quality assurance guideline limits.

The audit procedures employed and the audit results are described and discussed in the following sections.

Wind Speed System

The wind speed system was tested by three different methods. First, a torque watch test was performed on the sensor bearings to determine the sensor starting threshold. Second, the sensor shaft was prevented from rotating, thereby simulating a zero wind speed; and third, a simulated upscale wind speed (29.3 mph) was introduced into the sensor via a synchronous motor.

The torque watch test indicated that the sensor bearings had an acceptable starting threshold of less than 0.12 gmcm (1.0 mph).

The zero wind speed test result as read from the system was 0.5 mph. A reading of 0.5 mph is expected because the system is offset to account for the 0.5 mph specified starting threshold of the sensor.

The 600 rpm (29.3 mph) synchronous motor test result was 29.3 mph, which is the expected result, and is within the ± 1.6 mph quality assurance guideline for wind speed measurement systems.

Wind Direction System

The wind direction system was tested by two different methods. First, a torque watch test was performed on the sensor bearings to determine the sensor starting threshold, and second, a vane alignment to a point of known azimuth was performed to check the sensor alignment.

The torque watch test indicated that the sensor bearings had an acceptable starting threshold of approximately 0.8 gmcm (<1.0 mph).

The wind direction sensor vane was aligned to a tall stack to the west of the tower site. The azimuth from the tower to the stack was determined from a U.S. Geological Survey topographic map. This azimuth point is 274.5° for the vane tip and 94.5° for the vane tail.

The results of the vane tip and tail alignments were 272.5° and 94.5° respectively. This equates to an average vane alignment difference of -1.0°, which is well within the $\pm 3.0^\circ$ quality assurance guideline for wind direction measurement systems.

Atmospheric Pressure

The monitoring system barometer was audited by comparing the system response to the response of a calibrated aneroid barometer.

The system response of 30.18 inches of mercury and the calibrated barometer response of 30.23 inches of mercury have a difference of -0.16 percent. This result is well within the ± 1.0 percent quality assurance guideline for atmospheric pressure measurement systems.

Temperature

The temperature system was audited by placing the sensor probe and an NBS traceable thermometer in an ambient water bath and an ice water bath, and comparing the results.

The ambient water bath thermometer response was 65.0° and the sensor response was 64.3°F. The ice water bath thermometer response was 32.5°F and the sensor response was 32.2°F. The thermometer/sensor temperature differences for the ambient and ice water baths were +0.7°F and +0.3°F respectively. These results are well within the $\pm 1.8^\circ\text{F}$ quality assurance guideline for temperature measurements.

Relative Humidity

The relative humidity sensor was audited by comparing the system response to the calculated relative humidity as determined by sling psychrometer readings.

Mr. Robert Glazier
June 18, 1990
Page 3

The system response was 41.1 percent and the psychrometer calculated response was 50.0 percent. This test was performed two more times with similar results, wherein the sensor was reading low by 10-15 percent. The suggested QA guideline limit for relative humidity measurements is ± 5 percent.

On May 2, MAIN returned to the site to conduct a relative humidity audit under different meteorological conditions. These results also indicated that the sensor was reading low by 10-15 percent.

This problem was discussed with Climatronics Corporation, the sensor manufacturer, and it was decided to replace the sensor with a new sensor.

On May 7, the replacement sensor was installed in the system and audited. Once again the system was found to be recording relative humidity low by 10-15 percent.

Audits were conducted on at least four more occasions under varying weather conditions and with different auditing instrumentation, but the results were similar.

On May 15-17, at the request of Golder Associates, a calibrated recording hygrometer was deployed at the Industri-Plex site to concurrently record relative humidity with the system. The results of this comparison are illustrated on the attached graph. A copy of this graph was faxed to both you and David Adams of Climatronics Corporation on May 21.

This plot shows convincing evidence that the system sensor appears to be consistently reading low by 10-15 percent.

Conclusion

The Industri-Plex meteorological monitoring system, with the exception of the relative humidity sensory system, is recording accurate data which meets or exceeds quality assurance guidelines. The matter of the relative humidity system has been discussed at length with Golder Associates and Climatronics Corporation, but no final decision has been made concerning the system.

Please do not hesitate to call if you have any questions.

Sincerely,

CHAS. T. MAIN, INC.



Steven Falzarano
Quality Assurance Coordinator

SF/sh
cc: T. W. Fritts, MAIN

RELATIVE HUMIDITY AT GOLDER ASSC.

WOBURN, MA INDUSTRI-PLEX SITE.

